

Appendix F

Tobamovirus Methyltransferase

1
 TMV-KR MAYTQTATTSALLD TVRGNN SLVNDLAKRRLYDTAVEEFNARDRRPKVNF
 TMV-Rak MAYTQTATTSALLD TVRGNN SLVNDLAKRRLYDTAVDEFNARDRRPKVNF
 TMV-vul MAYTQTATTSALLD TVRGNN SLVNDLAKRRLYDTAVEEFNARDRRPKVNF
 TOMV MAYTQTATSSALLE TVRGNN TLVNDLAKRRLYDTAVDEFNARDRRPKVNF
 PMMV MAYTQQATNAALASTLRGNNPLVNDLANRRLYESAVEQCNAHRRPKVNF
 TMGMV MAHIQSIISNALLE SVSGKNTLVNDLARRRMYDTAVEEFNARDRRPKVNF
 TMV-OB MAHIQQSMQ GALLD TVRGQNSLVNDLAKRRLYDTAVEEFNAKDRRPKINF
 ORSV MAHFQQTMNTKVT EAGIGRNSLINDLAQRRVYDKPVEELNHRSSRPKVNF
 TVCV MAQFQQTIDMQTLQAAAGRNSLVNDLASRRVYD NAVEELNARSRRPKVHF
 CR-TMV MAQFQQTIDMQTLQAAAGPNSLVNDLASRRVYD NAVEELNARSRRPKVHF
 RMV-SH MAQFQQTVNMQTLQAAAGRNSLVNDLASRRVYD NAVEELNARSRRPKVHF
 CRMV MAQFQQTVNMQTLQAAAGRNSLVNDLASRRVYD NAVEELNARSRRPKVHF
 TMV-CG MAQFQQTVNMQTLQAAAGRNSLVNDLASRRVYD NAVEELNARSRRPKVHF
 CGMMV MANINEQINNQRDAAASGRNNLVSQLASKRVYDEAVRSLDHQDRRPKMNF
 CGMMV-W MANINEQINNQRDAAASGRNNLVSHLASKRVYDEAVRSLDHQDRRPKMNF
 CFMMV MANITQHINDTREAAAAGRNPLVAQLASKRVYDEAVKSLDSQDKRPKVNF
 YCGMMV MANITQQIIDTREAAAAGRNPLIAQLASKRVYDEAVKSLDTQDKRPKVNF
 SHMV ---MSTSTLINKAQ TNSCGDVGVVDLLKRKVYDDTVKTMQGLDRRAKYRL

51
 TMV-KR SKVISEEQTLIATRAYPEFQITFYNTQNAVHSLAGGLRSLELEYLMMQIP
 TMV-RAK SKVISEEQTLIATRAYPEFQITFYNTQNAVHSLAGGLRSLELEYLMMQIP
 TMV SKVISEEQTLIATRAYPEFQITFYNTQNAVHSLAGGLRSLELEYLMMQIP
 TOMV SKVISEEQTLIATRAYPEFQITFYNTQNAVHSLAGGLRSLELEYLMMQIP
 PPMV LRSISEEQTLIATKAYPEFQITFYNTQNAVHSLAGGLRSLELEYLMMQIP
 TMGMV SKTISEEQTLIVSNAYPEFQITFYNTQNAVHSLAGGLRALELEYLMLQVP
 TMV-OB SKSINEEQTLIVSQAYPEFQITFYNTQLAVHSLAAGLRSLELEYLMMQVP
 ORSV SKVISQEIIQATNAYAEFEITFYNTQLAVHSMAGGLRALELEYRRMQIP
 TVCV SKAVSTEQTLIATNAYPEFEISFTHTQSAVHSLAGGLRSLELEYLMMQVP
 CR-TMV SKAVSTEQTLIATNAYPEFEISFTHTQSAVHSLAGGFRSLELEYLMMQVP
 RMV-SH SKSVSTEQTLILASNAYPEFEISFTHTQHAVHSLAGGLRTLELEYLMMQVP
 CRMV SKSVSTEQTLILASNAYPEFEISFTHTQQAVHSLAGGLRTLELEYLMMQVP
 TMV-CG SKSVSTEQTLILASNAYPEFEISFTHTQQAVHSLAGGLRTLELEYLMMQVP
 CGMMV SRVSTEHTRLVTDAYPEFSISFTATKNSVHSLAGGLRLLELEYMMMQVP
 CGMMV-W SRVSTEHTRLVTDAYPEFSISFTATKNSVHSLAGGLRLLELEYMMMQVP
 CFMMV ARVLTTEQTRKVTESYPEFSISYASALSVHSLAGGLRYLEGEYLMQVP
 YCGMMV SRVLSTEQMRVVTENYPEFSVSYTGSALSVHSLAGGLRYLEGEYLMQVP
 SHMV NQCLGPEQCR TVRGGYPEFQIEFTGASNTSHAMAAGLRGLELEYLYTLVP

101
 TMV-KR YGSLTYDIGGNFASHLFKGRAYVHCCMPNLDVRDIMRHGQKDSIELYLS
 TMV-RAK YGSLTYDIGGNFASHLFKGRAYVHCCMPNLDVRDIMRHGQKDSIEL---
 TMV YGSLTYDIGGNFASHLFKGRAYVHCCMPNLDVRDIMRHGQKDSIELYLS
 TOMV YGSLTYDIGGNFASHLFKGRAYVHCCMPNLDVRDIMRHGQKDSIELYLS
 PPMV YGSTTYDIGGNFAAHMFKGRDYVHCCMPNMDLRDVMRHNAQKDSIELYLS
 TMGMV YGSPTYDIGGNFAAHLFKGRDYVHCCMPNLDIRDIMRHGQKDSIEMYLS
 TMV-OB YGSLTYDIGGNFAAHLFKGRDYVHCCMPNLDIRDIMRHENQKDSVATYLS
 ORSV FGSITYDIAGNFSAHIYKGRDYVHSCMRNLDIRDVARHINQQDTVSSYVA
 TVCV FGSLTYDIGGNFSAHLFKGRDYVHCCMPNLDVRDIARHEGHKEAIIYSYVN
 CR-TMV FGSLTYDIGGNFSAHLFKGRDYVHCCMPNLDVRDIARHEGHKEAIIHSYVN
 RMV-SH FGSLTYDIGGNFAAHLFKGRDYVHCCMPNLDVRDIARHEGHKEAIFS YLS
 CRMV FGSLTYDIGGNFAAHLFKGRDYVHCCMPNLDVRDIARHEGHKEAIFS YLS
 TMV-CG FGSLTYDIGGNFAAHLFKGRDYVHCCMPNLDVRDIARHEGHKEAIFS YIS
 CGMMV YGSPCYDIGGNYTQHLFKGRSYVHCCNPCLDLKDVARNVMYNDMITQHVQ
 CGMMV-W YGSPCYDIGGNYTQHLFKGRSYVHCCNPCLDLKDVARNVMYNDVVTQHVQ
 CFMMV YGSPVYDIGGNYSQHMLKGRAYVHCCNPCLDLKDVIARNEMYKDAIDRYVH

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YCGMMV    YGSPCHYIGGNYSQHMLKGRSYVHCCNPCLDLKDVARNEMYKDAIERYVT
SHMV      YGAVSYDIGGNFPAHMMKGRSYVHCCNPALDARDLARNENYRISIENYLS

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151

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TMV-KR    RL-----ERGG--KTVPNFQKEAFDRYAELPEDAVCHNTF
TMV-RAK   -L-----DRGG--KTVPNFQKEAFDRYAELPEDAVCHNTF
TMV       RL-----ERGG--KTVPNFQKEAFDRYAEIPEDAVCHNTF
TOMV      RL-----ERGN--KHVPNFQKEAFDRYAEMPNEVVCHDTF
PPMV      KL-----AQKK--KVI PPYQKPCFDKYTDDPQSVVCSKPF
TMGMV     RL-----SRSN--KVIPEFQREAFNRYAEAPNEVCCSKTF
TMV-OB    RL-----KARN--KVLPAFQQEAFQRYSESRDEVVCNNTF
ORSV      RL-----ERSK--RGLPVFQQSAFNKYMSDPDAVCSDKRF
TVCV      RL-----KRQQ--RPVPEYQRAAFNRYAENPHFVHCDKPF
CR-TMV    RL-----KRQQ--RPVPEYQRAAFNRYAENPHFVHCDKPF
RMV-SH    RL-----DRQK--RPVPEYQRAAFYNYAENPHFVHCDRPF
CRMV      RL-----DRQR--RPVPEYQRAAFNRYAENPHFVHCDRPF
TMV-CG    RL-----DRQR--RPVPEYQRAAFNRYAENPHFVHCDRPF
CGMMV     RH-----KGSCGCRPLPTFQIDAFRRYDSSPCAVTCSDVF
CGMMV-W   RH-----KGSGGCRPLPTFQIDAFRRYDSSPCAVTCSDVF
CFMMV     KKREAPRSNAWRARAESVQEIKDGRLPWSQIDAFQRYKDCPRAVTCNDVF
YCGMMV    KKRDGPRSVAWRSQAESSQETKFAGLPWSQMDAFRRYHSDPSSVTCPDVF
SHMV      RFEDKSGDYCQWQR---KKPKVSKPLPRYQKACFDRYNEDPEHVTCTSETF

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201

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TMV-KR    QTMRHQPMQQSGRVYAIALHSIYDI PADEFGAALLRKNVHTCYAAFHFSE
TMV-RAK   QTCEHQPMQQSGKVYAIALHSIYDI PADEFGAALLRKNVHTCYAAFHFSE
TMV       QTMRHQPMQQSGRVYAIALHSIYDI PADEFGAALLRKNVHTCYAAFHFSE
TOMV      QTCRHSQECYTGRVYAIALHSIYDI PADEFGAALLRKNVHVCYAAFHFSE
PPMV      QHCEGV-SHCTDKVYAVALHSLYDI PADEFGAALLRRNVHVCYAAFHFSE
TMGMV     QDCRIHPPENSGRRYAVALHSLYDI PVHEFGAALISKNIHV CYAASILAE
TMV-OB    QCCESNRYSSGGRVYAI SLHSLYDI PADELGAALLRKNVHTLYAAFHFAE
ORSV      QECSYS-VDLPGKTYAVGLHSIYDI PADEFGAALLRKDVHICYAAFHISE
TVCV      QQCELT-TAYGTDTYAVALLSIYDI PVEEFGSALLRKNVKT CFAAFHFHE
CR-TMV    QQCELT-TANGTDTYAVALLSIYDI PVEEFGSALLRKNVKT CFAAFHFHE
RMV-SH    QQCEIS-TVNGADTYAIALHSIYDI PADEFGAALLRKNVKICYAAFHFHE
CRMV      QQCELS-TVNRWDTYAIALHSIYDI PADEFGAALLRKNVKICYAAFHFHE
TMV-CG    QQCKLS-AANGADTYAIALHSIYDI PVDEFGAALLRKNVKICYAAFHFHE
CGMMV     QECSYD-FGSGRDNHAVSLHSIYDI PYSSIGPALHRKNVRVCYAAFHFSE
CGMMV-W   QECSYD-SGSGGDNHAVSLHSIYDI PYSSIGPALHRKNVRVCYAAFHFSE
CFMMV     QECQYE-HTRRGDRYAVALLHSIYDI PFEQIGPALLRKNIKVLFAAFHFSE
YCGMMV    QQCEHE-FSRGGDRYAVALLHSIYDVPCEQIGPALLRKNIKVLFAAFHFSE
SHMV      EKCRISPPAERDDIYATSLHSLYDI PYQNLGPALARKRIKVLHAAFHFSE

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251

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TMV-KR    NLLLEDSYVNLDEINACFSRDGDKLTFSFAESTLNYCHSYSNILKYVCK
TMV-RAK   NLLLEDSYVNLDEINACFSRDGDKLTFSFAESTLNYCHSFSNILKYVCK
TMV       NLLLEDSYVNLDEINACFSRDGDKLTFSFAESTLNYCHSYSNILKYVCK
TOMV      NLLLEDSHYNLDEINACFQRDGDRLTFSFAESTLNYSHSYSNILKYVCK
PPMV      NLLLEDSYVSLDDIGAFFSREGDMLNFSFVAESTLNYTHSYSNVLKYVCK
TMGMV     ALLLDQTEVTLNEIGATFKREGDDVSFFFAESTLNYSHKYKNILHYVVK
TMV-OB    ELLLEVSTVELPTIGGIFSRDGDKINFCSNESTLNYSHSYSNLLKYVCK
ORSV      NLLLETSAPLDEIGATKYKSGDRLSFFIQNESTLNYEHSYKNVIKYVCK
TVCV      NMLLDCDTVTLDEIGATFQKSGDNLSFFFHNESTLNYTHSFSNI IKYVCK
CR-TMV    NMLLDCDTVTLDEIGATFQAGDNLSFFFHNESTLNYTHSFSNI IKYVCK
RMV-SH    NMLLDCDSVTLEDIGATFQAGDKLNFFFHNESTLNYTHSFSNI IKYVCK
CRMV      NMLLDCDSVTLEDIGATFQAGDKLNFFFHNESTLNYTHSFSNI IKYVCK
TMV-CG    NMLLDCDSVTLEDIGATFQAGDKLNFFFHNESTLNYTHSFSNI IKYVCK
CGMMV     ALLLGSPVGNLNSIGAQFRVDGDDVHFLFSEESTLHYTHSLENIKLIVMR
CGMMV-W   ALLLGSPVGNLNSIGAQFRVDGDDVHFLFSEESTLHYTHSLENIKLIVMR
CFMMV     ELLLGQSF GALPNIGAFFT VNGDSVEFQFEEESTLHYSHSFQNIKIVTR

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YCGMMV DLLIGSEFGRLPNVGAFSVDGDSVNFQFEDESTLHYTHSFSNIRKIVTR
 SHMV DLLLGASEGLLTQIGGTGFRNGDVLTFSLDESSLIYTHSFRNVFEYVTR

301

TMV-KR TYFPASNREVYMKFLVTRVNTWFCKFSRIDTFLLYKGVAAHKSVDSEQFY
 TMV-RAK TYFPASNREVYMKFLVTRVNTWFCKFSRIDTFLLYKGVAAHKSVDSEQFY
 TMV TYFPASNREVYMKFLVTRVNTWFCKFSRIDTFLLYKGVAAHKSVDSEQFY
 TOMV TYFPASNREVYMKFLVTRVNTWFCKFSRIDTFLLYKGVAAHKGVDSEQFY
 PPMV TYFPASSREVYMKFLVTRVNTWFCKFSRLDTFVLYRGSVYHRGVDKEQFY
 TMGMV SYFPASSRIVYFKEFLVTRVNTWFCKFTKVDYIILYKSVRQVGCDSQDYFY
 TMV-OB TYFPASNRFVYMKFLITRVNTWFCKFTKLDYTYLYRGSVYHRGCDQQEFY
 ORSV TFIPASNRFVYHKEFMCTRVNTWFCKFTKVDYTYFLFRGSVYTRGEDSEQFY
 TVCV TFFPASQRFVYHKEFLVTRVNTWYCKFTRVDFTTLFRGSVYHNNVDCEEFY
 CR-TMV TFFPASQRFVYHKEFLVTRVNTWYCKFTRVDFTTLFRGSVYHNNVDCEEFY
 RMV-SH TFFPASQRYVYHKEFLVTRVNTWYCKFTRVDFTTLFRGSVYRTSVDSEEFY
 CRMV TFFPASQRYVYHKEFLVTRVNTWYCKFTRVDFTTLFRGSVYKTSVDSEEFY
 TMV-CG TFFPASQRYVYHKEFLVTRVNTWYCKFTRVDFTTLFRGSVYRSSVDSEEFY
 CGMMV TYFPADDRFVYIKEFMVKRVDTFFFRLVRADTHMLHKSVMGHYS-KS-----
 CGMMV-W TYFPADDRFVYIKEFMVKRVDTFFFRLVRADTHMLHKSVMGHYS-KS-----
 CFMMV TYFPASDRVVYVKEFMVKRVDTFFFRMVRVDTHMLHKSVMGYTP-VC-----
 YCGMMV TFFPASDRVVYVKEFMVKRVDTFFFRMVRVDTHMLHKSVMGQYQ-VS-----
 SHMV TFFVACNRYAYMKEFRSRRVDTVFCSFIRIDTYCLYRSVFKDC-DEHV-F

351

TMV-KR TAMEDAWHYKKTLMCNSERILLEDDSSSVNYWFPKMRDMVIVPLFDISLE
 TMV-RAK TAMEDAWHYKKTLMCNSERILLEDDSSSVNYWFPKMRDMVIVPLFDISL-
 TMV TAMEDAWHYKKTLMCNSERILLEDDSSSVNYWFPKMRDMVIVPLFDISLE
 TOMV KAMEDAWHYKKTLMCNSERILLEDDSSSVNYWFPKMRDMVIVPLFDISLE
 PPMV SAMEDAWHYKKTLMAMNSERILLEDDSSSVNYWFPKMKDMVIVPLFDVSLQ
 TMGMV EAMEDAFAYKKTLMAMNTERAIFRDASVNFVFPKMKDMVIVPLFEGSIT
 TMV-OB SAMEADAWHYKKTLMAMNSERIVLEDDHSSSVNYWFPKMKDMVIVPLFDVSLE
 ORSV TAMDEAWYKKTLMAMNSERTIFRDRAAVNFRFPKVKDMVIVPLFDGSVT
 TVCV KAMDDAWHYKKTLMAMNAERTIFKDAAALNFVFPKVRDMVIVPLFDASIT
 CR-TMV KAMDDAWHYKKTLMAMNAERTIFKDAAALNFVFPKVRDMVIVPLFDASIT
 RMV-SH KAMDDAWYKKTLMAMNSERTIFKDSAAAMNFVFPKVRDMVIVPLFDASIT
 CRMV KAMDDAWYKKTLMAMNSERTIFKDSAAAMNFVFPKVRDMVIVPLFDASIT
 TMV-CG KAMDDAWYKKTLMAMNSERTIFKDSAAAMNFVFPKVRDMVIVPLFDASIT
 CGMMV -----KSEYFALNTPPIFQDKATFSVWFPEAK-KVLI PKFELSRF
 CGMMV-W -----KSEYFALNTPPIFQDKATFSVWFPEAKRKVLI PKFELSRF
 CFMMV -----ATNYFSLKSSPIFQDKATFSVWFPAKSKVVIPIFKMQGF
 YCGMMV -----KNDYYSLKSSPVFQDKATFSVWFPAKSKVVIPLFEMQGF
 SHMV AAMDDAWEFKKKRVMLEASRPINFNDVAQFNVPNAKDKVCLPIFAVKS

401

TMV-KR TSKR--TRKEVLVSKDFVFTVLNHIRTYQAKALTYANVLSFVESIRSRVI
 TMV-RAK -----SRKEVLVSKDFVFTVLNHIRTYQAKALTYANVLSFVESIRSRVI
 TMV TSKR--TRKEVLVSKDFVFTVLNHIRTYQAKALTYANVLSFVESIRSRVI
 TOMV TSKR--TRKEVLVSKDFVFTVLNHIRTYQAKALTYSNVLSFVESIRSRVI
 PPMV NEGKRLARKEVMVSKDFVFTVLNHIRTYQSKALTYANVLSFVESIRSRVI
 TMGMV SKKM--TRSEVINRDFVFTVLNHIRTYQAKALTYQNVLSFVESIRSRVI
 TMV-OB TQKR--TKKEVIVSKDFVFTVLNHIRTYQAKALTYNNVLSFVESIRSRVI
 ORSV SGKM--KRREVMVNKDFVFTVLNHIRTYQDKALTYKNVLSFVESIRSRVI
 TVCV TGRM--SRREIMVNKDFVFTVLNHIKTYQAKALTYANVLSFVESIRSRVI
 CR-TMV TGRM--SRREVMVNKDFVFTVLNHIKTYQAKALTYANVLSFVESIRSRVI
 RMV-SH TGRM--SRREVLVNKDFVFTVLNHIKTYQAKALTYANVLSFVESIRSRVI
 CRMV TGRM--SRREVLVNKDFVFTVLNHIKTYQAKALTYANVLSFVESIRSRVI
 TMV-CG TGRM--SRREVLVNKDFVFTVLNHIKTYQAKALTYANVLSFVESIRSRVI
 CGMMV LSGNVKISR-MLVDADFVHTIINHISTYDNKALVWKNVQSFVESIRSRVI
 CGMMV-W LSGNVKISR-MLVDADFVHTIINHISTYDNKALVWKNVQSFVESIRSRVI
 CFMMV FTGSIVAEEK-MMIDASFIHTVINHICTYDNKALTWRNVQSFVESIRSRV

YCGMMV FSGTLKSKK-MLVDATFIHTVINHICTYDNKALTWRNVQSFVESF-GLGC
 SHMV SGAPVTTRH-ILVEKDFYWTALNHILTYPDGKADFRGVMSFLESIRSRVV

451

TMV-KR INGVTARSEWDVDKSLQSLSMTFYLHTKLAVLKDDLLISKFSLGSKTVC
 TMV-RAK INGVTARSEWDVDKSLQSLSMTFYLHTKLAVLKDDLLISKFSLGSKTVC
 TMV INGVTARSEWDVDKSLQSLSMTFYLHTKLAVLKDDLLISKFSLGSKTVC
 TOMV INGVTARSEWDVDKSLQSLSMTFYLHTKLAVLKDDLLISKFALGPKTVS
 PPMV INGVTARSEWDVDKALLQSLSMTFLLQTKLAMLKDDLQVQFQVHKSALT
 TMGMV INGVTARSEWDVDKAILQPLSMTFLLQTKLALQDDIVMGKFRCLDKTTS
 TMV-OB INGVTARSEWDVDKALLQSMAMTFLLITKLSMLKDELLVSKFTLSAKSVH
 ORSV MNGVTARSEWEVDKSVLQPLSMTFLLQTKLAEAKDQVVLKFKQKIDDTVT
 TVCV INGVTARSEWDTDKAILGPLAMTFLLITKLGHVQDEIILKKFQKFDRTTN
 CR-TMV INGVTARSEWDTDKAILGPLAMTFLLITKLGHVQDEIILKKFQKFDRTTN
 RMV-SH INGVTARSEWDTDKAILGPLAMTFLLVTKLSHVQDEIVLKKFQKFDATAK
 CRMV INGVTARSEWDTDKAILGPLAMTFLLVTKLSHVQDEIVLKKFQKFDATAK
 TMV-CG INGVTARSEWDTDKAILGPLAMTFLLVTKLSHVQDEIVLKKFQKFDATTK
 CGMMV VNGVSVKSEWNPVDQLTDISFSIFPLVKVRKVQIELMSDKVVEIARGLL
 CGMMV-W VNGVSVKSEWNPVDQLTDISFSIFLLVKVRKVQIELMSDKVVEIARGLL
 CFMMV VNGVSVSEWDVPVELLTDISFTVFLLVKVKKTQIEIMSDKIVTQPQGLI
 YCGMMV MNGVSVRSEWDPIEMLCDISFTVFLTVKV-KVQIEIMSEKIVTQPQGLL
 SHMV INGTTTASQWEVDKSQLKDIALSLLLIKLEKLIKISVIEKRIKIERQGLV

501

TMV-KR QHVWDEISLAFGNAPPSVKERLLNRKLIRVAGDALEIRVPDLYVTFHDRL
 TMV-RAK QHVWDEISLAFGNAPPSVKERLLNKKLIRAAGDALEIKVPDLYITFHDRL
 TMV QHVWDEISLAFGNAPPSVKERLLNRKLIRVAGDALEIRVPDLYVTFHDRL
 TOMV QHVWDEISLAFGNAPPSIKERLINRKLITENALEIRVPDLYVTFHDRL
 PPMV EYVWDEITAAFNCFPTIKERLINKKLITVSEKALEIKVPDLYVTFHDRL
 TMGMV ELIWDEVGKFFGNVFPTIKERLVSRLKILDVSENALKIKIPDLYVTWKDRF
 TMV-OB EHVWDEIKRGCNMFPSLKESSLRKKLISGSAEELEIEVPDLYVTFHDFR
 ORSV NLFWKQISDAVGDLFPSIKERLISGGFVKVAEQSLQIKTPDEYITFADKL
 TVCV ELIWTSLCDALMGVIPS VKETLVRGGFVKVAEQALEIKVPELYCTFADRL
 CR-TMV ELIWTSLCDALMGVIPS VKETLVRGGFVKVAEQALEIKIPELYCTFADRL
 RMV-SH ELIWSSLCDALKGVIPS VKETLARGGFVKLAEESELEIKIPELYCTFTDRL
 CRMV ELIWSSLCDALKGVIPS VKETLARGGFVKLAEESELEIKIPELYCTFTDRL
 TMV-CG ELIWTSLCDALKGVIPS VKETLARGGFVKLAEESELEIKIPELYCTFTDRL
 CGMMV RRFADSLKSAVEGLGDCVYDALVQTGWFDTSDELKVLLPEPFMTFSDYL
 CGMMV-W RRFADSLKSAVEGLGDCVYDALVQTGWFDTSDELKVLLPEPFMTFSDYL
 CFMMV ERIVQVRSEAFEGCTEAVQKALLTSGWFRTPADDLVLDIPELFMDFHDFL
 YCGMMV LRLAQKVSDAFEGCTATIHAALMSTGWFRCADELVEAPELFMDFHDFL
 SHMV SLLKEFLHGLLDEYTQTMAEWVVEKGWVKSVDQVLQVTIPDLVLNFRDHF

551

TMV-KR VTEYKASVDMPALDIRKKMEE--TEVMYNALSEL SVLRESKDFDQVDFVSQ
 TMV-RAK VA EYKSSVDMPALDIRKRMEE--TEVMYNALSEL SVLRESKDFDQVDFVSQ
 TMV VTEYKASVDMPALDIRKKMEE--TEVMYNALSEL SVLRESKDFDQVDFVSQ
 TOMV VSEYKMSVDMPLDIRKKMEE--TEVMYNALSEL SVLKNSDKDFDQVDFVSQ
 PPMV VKEYKSSVEMPVLVDVKKSL--AEVMYNALSEL SILKDSKDFDQVDFSR
 TMGMV VA EYTKSEELPHLDIKDLE--AEQMYDALSEL SILKGADNFDIAKFKD
 TMV-OB VA EYKASVEMPTIDISKDLSE--AESYYSALSEL SVLENLSDKDFDLEKFSR
 ORSV VMEYKATEELQHLDISKPLER--AEKYYNALSEL SVLKESEDFDITQFKN
 TVCV VLQYKKAEEFQSCDLSKPLEE--SEKYYNALSEL SVLENLSDLEAFKT
 CR-TMV VLQYKKAEEFQSCDLSKPLEE--SEKYYNALSEL SVLENLSDLEAFKT
 RMV-SH VLEYKRTEEFQSCDLSKPLEE--SEKYYNALSEL SVLENLSDLDFAFKE
 CRMV VLEYKRTEEFQSCDLSKPLEE--SEKYYNALSEL SVLENLSDLDFAFKE
 TMV-CG VLQYKMAEEFKSCDLSKPLEE--SEKYYNALSEL SVLENLSDLDGFKE
 CGMMV EGMYEADAKIERESVSELLAS--GDDLFFKKIDEIRNNYSGVEFDVEKFQE
 CGMMV-W EGTYEADAKIERESVSELLAS--GDDLFFKKIDEIRNNYSGVEFDVEKFQE
 CFMMV SGVFESRMLVLRRTVEKCFKRFPSTFIRLYRKLCLERYSGIEFDLEQVSD

YCGMMV SAAWEADAKIEAANVESVLDA--SDRLYTTVNELCERYSGIEFDLEKFTD
 SHMV RCEFRTSANVSEVNVSEHLVA--TNEYAKVSDLVDRNPTLAFDFEKFQD

601

TMV-KR MCQSLEVDPMATAAKVIVAVMSNESGLTLTTERPTEANVALALQDQ-EKAS
 TMV-RAK MCKSLEVDPMATAAKVIVAVMSNESGLTLTTERPTEANVAQALQDQ-EKAS
 TMV MCQSLEVDPMATAAKVIVAVMSNESGLTLTTERPTEANVALALQDQ-EKAS
 TOMV MCQSLEVDPMATAAKVIVAVMSNESGLTLTTEQPTEANVALALQDS-EKAS
 PPMV MCNTLGVDPLVAAKVMVAVMSNESGLTLTTERPTEANVALALQPTITSKE
 TMGMV MCKALDVSPDVAARVIVAVAENRSGTLTTFDKPTEENVAKALKSTASEAV
 TMV-OB MCAINCVPNDIAAKIVVAVLSNESGVTLPFKEPTEGNMAEAMKSGEKDEV
 ORSV LCEEKDIAPDLAKVIVPIMKNE--LTLPFNNPTPEALSDALSPLPKDLD
 TVCV LCQQKNVDPDMAAKVVVAIMKSE--LTLPFKKPTEEEISESLKPGECSA
 CR-TMV LCQQKSVDPMATAAKVVVAIMKCE--LTLPFKKPTEEEISESLKTGEGTSA
 RMV-SH LRQKKNVDPDVAAKVMVAIMNSE--LTLPFKKPTEEEVAEALSSEVVQDE
 CRMV LCQKKNVDPDVAAKVVVAIMNSE--LTLPFKKPTEEEVAEALSSEVVQDE
 TMV-CG LCQKKNVDPDVAAKVVVAIMNSE--LTLPFKKPTEEEIAEALSSEVKQSE
 CGMMV FCKELNVNPMPLIGHVIEAIFSQKAGVTVTGLGTLSPMGASVALSSTSVD
 CGMMV-W FCKELNVNPMPLIGHVIEAIFSQKAGVTVTGLGTLSPMGASVALSNTSVD
 CFMMV FCHHHDVNPALVGPVIEAIFSQTAGITVTGLSTKSVEWAAAEALAPTSVD
 YCGMMV FCHHHDVNPSLIGTVIEAIFSQSAGITVTGL----QAKSLEWAAAEALAP
 SHMV YCEKLGVDIDTVTELIDAISTGRAGITLDHTDDKEEQLPRTLAGESSYLE

651

TMV-KR EGALVVTSR-EVEEPSM
 TMV-RAK EGALVVTSR-EVEEPSM
 TMV EGALVVTSR-EVEEPSM
 TOMV DGALVVTSR-DVEEPSI
 PPMV EGSLKIVSS-DVGESSI
 TMGMV VCLEPTSEEVNVNKFISI
 TMV-OB LTLGSQTDNTDLTSKSM
 ORSV MRFSLKLSTCAPFPSV
 TVCV EHKEVLSLQNDAPFPCV
 CR-TMV EHKDVLSLQNDAPFPCV
 RMV-SH G----LSLSNNAPFPCV
 CRMV G----LRLSNKAPFPCV
 TMV-CG G----LSLSNNAPFPCV
 CGMMV TCEDMDVTEDMEDIVLM
 CGMMV-W TCEDMDVTEDMEDIVLM
 CFMMV MDCDSDEELEQKFPNL
 YCGMMV VDDDMDCSSDEEDAAPH
 SHMV EEPDDLVLCLSDKAIVN

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